ANTHROPOLOGY AT THE BRITISH ASSOCIATION.

THE address of the president, Mr. Henry Balfour, dealt with the subject of evolution in the material arts as illustrated by the work of the late Lieut.-General Pitt Rivers, and has been already printed in full in NATURE (September 1).

Evolution in the Material Arts.

The remainder of the programme on August 18 was appropriately reserved for communications which illustrated the application of the theory of evolution to special problems of art and technology, as follows :—

Prof. Oscar Montelius gave a demonstration of the evolution of the lotus ornament, which, though it brought forward no new points, gave a well illustrated survey of the work of Goodyear and others, and analysed the complicated results of the interaction of naturalistic and conventional treatments of the same original motive. The discussion which followed was mainly directed to secure recognition for other plant-motives, such as the fleur-de-lys, iris, papyrus, as being partly responsible for certain variations of the "lotus-ornament," and the inevitable skirmish followed the mention of the "Ionic capital."

Prof. Flinders Petrie's note on the entomology of scarabs distinguished five principal types of scarab-backs, designed in imitation of five genera of beetles, Scarabæus, Catharsius, Copris, Gymnopleurus, and Hypselogenia, and showed how the characteristic forms of the head, elytra, and legs of these genera have given rise to a large number of conventional variants. The use of other beetles besides the true Scarabæus, for magical purposes, is well attested both by the medical papyri and by the modern folk-lore of Egypt.

Prof. Flinders Petrie's description of his excavations at Ehnasya (Herakleopolis Magna), in Egypt, was chiefly noteworthy for his comparative study of the forms of the Roman lamps and terra-cotta figurines, which were obtained in large enough numbers to afford an intelligible series. Here, also, a very few principal types have degenerated into numerous conventional and unintelligible variations, which have often influenced each other and given rise to fresh types based on misinterpretation of the blurred forms. In this instance it is noteworthy that the older and purer forms can be proved to have survived alongside even the most corrupt; as if the latter, though well established, pursued a separate course, and failed to supplant their archetypes.

Another point of some interest in this connection is Prof. Petrie's discovery, near Ehnasya, of a modern Coptic cemetery which preserves, in its tomb-façades and enclosures, many architectural features which are characteristic of ancient Egyptian burial-places.

Mr. R. T. Günther read on August 22 a study of the *cimaruta,* a common Neapolitan charm representing in silver a sprig of rue with magical symbols appended. He brought together a large number of examples, and supplied full details of the successive developments which the originally naturalistic model has undergone, as well as of the significance of the emblems which have been added to the rue-plant to increase its prophylactic powers.

Physical Deterioration and Anthropometric Surveys.

The session of August 19 was devoted to a systematic discussion of the alleged physical deterioration of the people of these islands, with special reference to the recent report of the Privy Council Committee, and to the scheme proposed by the association's committee on anthropometric investigation for the organisation of an anthropometric bureau to collect and analyse more adequate data than those which are at present available

The report of the committee on anthropometric investigation was read by the secretary, Mr. J. Gray. Some progress has been made in the determination of the necessary standards of measurement, and the chairman and secretary of the committee have given evidence before the Privy Council's Committee as to the data which already existed, and as to the best means of securing an adequate, continuous, and homogeneous series in future. The committee recommends a small permanent anthropometric bureau, organised as a committee of the Privy Council, with an honorary consultative body, a director and deputy director (trained, one in anthropology, the other in statistical method), and an adequate body of surveyors, male and female, who would visit schools, factories, and other institutions, and secure representative sets of measurements. An appendix to the report takes account of the surveys already in progress in Scottish schools and lunatic asylums, in London hospitals, in Dorsetshire, and among the gipsies of the Scottish border.

Prof. D. J. Cunningham, F.R.S., who is chairman of the anthropometric committee, accepted the general conclusion of the "epoch making" report of the Privy Council Committee, that there was no serious physical deterioration in the nation at large, but held strongly that without proper environment and nurture, and particularly without proper air and food, it was impossible to maintain in the coming generation the mean national standard of physique to which a people tends naturally to approximate, so far as outward circumstances permit. Slow evolutionary changes in this physical standard are taking place, but except in regard to the teeth, which are degenerating rapidly, they may be neglected in practice. The recent improvement in the physique of women of the upper and middle classes is due to healthier conditions and habits, and illustrates their effects. In spite, however, of the labours of the British Association's Anthropometric Committee in 1878–83, the evidence on which all inferences have been based hitherto is fragmentary, ill-coordinated, and quite inadequate, and a systematic survey such as is now proposed would put the whole matter on a quite different footing. The cost would be slight, and the national advantage incalculable.

Dr. F. C. Shrubsall followed with a comparison of the physical characters of hospital patients with those of healthy individuals from the same areas, with suggestions as to the influence of selection by disease on the constitution of city populations. Blondes are found to suffer more than brunettes from rheumatic disorders, and less from tuberculosis, nervous disorders, and cancer. Blondes also suffer more from disease in childhood, and their numbers and proportion consequently diminish until the age of twenty to twenty-five, when the pulmonary tuberculosis of the brunettes begins rapidly to redress the balance. In cities, the most overcrowded and most unhealthy areas are consequently the most brunette, and also have the highest infant mortality through the extinction of blonde children by disease. Dr. Shrubsall's paper was well illustrated with original tables and maps, and was evidently followed with close attention.

Mr. J. Gray then explained in detail the working of an anthropometric survey, and the valuable results which may be expected from it in anthropological science, and in practical economy and hygiene. Civilisation has brought so many new influences to bear on the more advanced races of mankind that more accurate and copious observations are required to detect in their inception deep-seated changes in the relation of man to his environment, the effects of which may be controlled if recognised in time.

The president of the association, who occupied the chair in the section throughout the session, opened the discussion by the inquiry, what is the precise nature and effect of the set of circumstances which we describe as "town life"? the most important of the temporary and obvious causes of physical deterioration, as opposed to the permanent and insidious causes indicated by Dr. Cunningham. Mere want of indoor ventilation, for example, does not produce deterioration, *e.g.* in the one-room cottages of the gigantic Lowlanders of Scotland; and both sanitation and quality of food are, on the whole, better in the towns than in the country. Among the causes which might produce permanent changes in the national physique, three seemed particularly noteworthy. Since marriage is later, and families are smaller, in the middle classes than in the lower, facilities for "rising," such as are given by modern education, cannot but diminish the proportion in the next generation of the offspring of the more efficient in this. Town life, too, by encouraging a brunette population, is altering the inherited characteristics of the nation at the expense of the traits which we owe to our blonde ancestry. Further, town life, by attracting the more energetic elements in the rural population, is throwing upon the less efficient remainder the greater part of the burden of continuing the race. Town life, however, does not seem to be among the factors which it is possible to eliminate by legislation, and it is permanently selective agencies such as this which affect the actual quality of a race.

Sir John Gorst considered it proved that a large proportion of the nation lives in conditions unfavourable to normal development, and that the race is being propagated in undue proportion by the lowest and least fit. The general death-rate decreases, for instance, but not the death-rate for infants. Legislation might fairly prohibit marriage between the immature or the mentally unfit; but the main cause of the relative increase in the low-class birth-rate is, as the Royal Commission in New South Wales has shown, the luxurious reluctance of the well-to-do to take their share in bringing up the next generation. Meanwhile, in so far as it controls any part of a child's lifetime, as it does by compulsory education, the State is so far responsible for securing it sufficient air and food. There are many ways of securing these and of coercing neglectful parents, and local authorities might well be given permission to experiment in the manner suggested by the medical faculty of Scotland in regard to the Scottish Education Bill.

Prof. Rudolfo Livi, director of the Italian Military Survey, described its methods, and replied to Dr. Cunningham's criticisms of military measurements. Conscript statistics, however, yield more representative data than those of a voluntary army, and the Italian survey establishes clearly the correlation between prosperity and enlightenment and immunity from disease. In England, probably the mitigation of extreme social conditions favoured a relatively high physique.

Mr. E. W. Brabrook, secretary of the British Association Committee of 1878–83, urged the importance of uniformity of measurements, and assured the anthropometric committee of the cooperation of existing surveys.

Major McCulloch described the survey, recently ordered, of children in army schools, and discussed practical difficulties of uniform measurements. Prof. A. Macalister insisted on the necessity for large numbers of observations. Statistical conclusions from inadequate data are fallacious.

Mrs. Watt Smyth recommended the inclusion of simple anthropometric observations in the ordinary routine of school registration as an aid to the teacher in following the development of the child. In Boston, U.S.A., such daily observation greatly diminished the risk of infectious disease. The valuable results thus attained would facilitate a full national survey.

Other papers on anthropological organisation occupied the afternoon of August 19. Mr. Edgar Thurston described the progress of the ethnographic survey in Madras, of which he has been the principal organiser, going into details as to method and cost, the nature of the evidence which it is possible to collect, both in anthropometry and in ethnography, the photographic record of racial types, and the difficulties of combined museum and field work such as are unavoidable with an infinitesimal staff working among ignorant and timid populations. He concluded with a summary of the ethnography of the area covered by the survey, and a criticism of the published measurements of the Indian Coronation contingent.

The report of the committee on anthropological teaching described the method of inquiry, and gave details of the position occupied by anthropology or its main subdivisions in some seventy-five universities and colleges in Europe, the United States, and elsewhere, with many interesting data as to the ways in which this comparatively new study has won recognition as an offshoot of this or that recognised subject, and as to the practical applications which are found to emerge wherever a more enlightened policy has permitted a museum or university to provide adequate teaching.

Mr. J. F. Tocher described in detail the recent anthropometric work in Scotland outlined in the morning's discussion, and also the distribution and variation of the surnames in east Aberdeenshire in 1696 and 1896. Migration accounts for the disappearance of many names; but the extinction calculated by Galton and Watson is found to be approximately correct, and likewise the rate of change on Karl Pearson's theory of contingency.

Anthropography.

The experiment was made on Monday morning (August 22) of a separate subsection for the discussion of papers on human anatomy and kindred subjects. The lecture room of the zoological department was kindly lent for this, and Prof. A. Macalister presided.

Dr. G. Elliot Smith made a communication on the persistence in the human brain of certain features usually supposed to be distinctive of apes, based on a large series of simple human brains, chiefly African. Simian characters are most conspicuous in the occipital region, because the visual area is as well developed in apes as in man; but though the structure is identical, the shape of this area in man is much distorted by increase of the cortical area in front of it. Simian resemblance is more often retained in the left occipital region than in the right, because in man the visual centre retracts more towards the mesial surface on the right side, and this asymmetry often influences the cranial form. Large "Affenspalten" may occur in various races, but are rarely symmetrical, except in Negro brains, which are distinctly more pithecoid. In discussion, Mr. Duckworth described similar simian features in Australian brains, with frequency of 50 per cent.; Prof. Grünbaum brought physiological evidence to corroborate the anatomical data; Prof. Windle and Prof. Macalister fully accepted Dr. Elliot Smith's conclusions.

Mr. Duckworth showed photographs of the brain of a fœtal gorilla suggesting the artificial nature of the cerebral fissures. Prof. Grünbaum suggested histological examination, and Prof. Macalister summarised the history of the recent study of these features.

Mr. R. B. Seymour Sewell described some variations in the astragalus observed in 1000 specimens, mainly Egyptian. Their angle of collum and corpus is intermediate between the European and the anthropoid; changes in the articular surfaces are determined by the adoption of certain postures, and by the progressive eversion of the foot. Accessory facets are occasionally present, and facets are occasionally fused or absent. The os trigonum is very variable. Prof. Windle criticised Pfitzner's view of the os trigonum.

Mr. P. P. Laidlaw described some varieties of the os calcis, based on the Cambridge collections, namely:—(1) variability of the processus trochlearis, which seems not to develop from a separate ossicle; (2) external plantar tubercle; (3) calcaneus secundarius of Gruber; (4) os sustentaculi proprium; (5) processus trochlearis of Kyrtl, shown to be pathological; (6) variation of facets due to ossicles and other factors; (7) European reduced projection of the heel due to backward extension of the fascia articularis posterior. In discussion, he gave the length of the Egyptian heel-bone as 3 per cent. more than that of the European.

Mr. F. G. Parsons's paper on facial expression discussed the anatomy of the facial muscles, and illustrated their effects from historic portraits. Prof. Windle attributed alteration of expression to habitual action of certain muscles, probably recorded in the subcutaneous tissues; on this fœtal evidence should be decisive. Mr. Parsons replied that subcutaneous thickening is already perceptible at the ninth month.

Mr. J. Gray proposed a new system of classifying the records in anthropometric identification. The Bertillon system with fixed subdivisions only identifies 61 per cent. on the first search. The system proposed substitutes progressive subclassification of the data of one measurement by the data of the next in order. Search is further simplified by the use of charts on which dimensions used as coordinates determine the position of a record-number. The discussion only emphasised the need of accurate measurement.

The committee on anthropometric investigations among the native troops of the Egyptian Army reported progress in coordinating Dr. Myers's data. The modern population of Kena province shows less variability in head length and breadth than the prehistoric population (at Nagada), but more in cephalic index. The greater variability of Theban mummies is explicable by racial admixture in a large city. The objections raised to inferences from conscript data seem to be invalid. The Coptic population is apparently more variable than the Mohammedan, apparently because variability increases the chance of survival, and so multiplies among the oppressed.

Dr. Myers's paper on the variability of ancient and modern peoples elaborated the last-named point in comparison with data from elsewhere. Ancient and modern peoples do not seriously differ in variability, provided the external conditions are similar, while favourable conditions tend to homogeneity, *i.e.* regression towards the mean; and *vice versâ*.

Mr. Duckworth discussed the methods of graphical representation of the various racial human types employed by Keane, Flinders Petrie, Thomson, and Strentz, and proposed the simile of a protoplasmic origin modified into processes representing the various morphological types.

Prof. A. Macalister exhibited a series of Amorite crania from excavations at Gezer, in Palestine. The people of the first two strata practised cremation, and so destroyed their skulls, but the third and fourth strata show burials in contracted posture, accompanied by food vessels.

Linguistics.

On the morning of August 22 Sir Richard Temple, Bart., explained a plan for a uniform scientific record of the languages of savages, which starts from the sentence as unit-expression of a complete meaning, and classifies words according to their function in the sentence. The forms assumed by words grow out of these functions, and are determined by sundry functional affixes. The sentence considered as the elementary component of a language indicates the outlines of a classification of languages, and the conditions under which languages and linguistic groups develop. The plan has been successfully applied to several savage tongues, as well as to Latin, English, and Hungarian, and claims consideration as leading to rapid and accurate analysis and acquisition of language.

General Ethnology.

Mr. A. W. Howitt read on Monday a paper on group-marriage in Australian tribes. Among the tribes round Lake Eyre, two forms of marriage occur. One follows upon betrothal of children by their mothers, and the other is the subsequent marriage of the woman to a younger brother of her husband. On ceremonial occasions this latter form of marriage is extended in the tribe by the allotment to each other of men and women who are already allotted to each other under one or other of the two marriages. This group-marriage also occurs in other tribes in south-east Australia, either in the form which it has in the Lake Eyre tribes or as a survival of custom. It is shown by the system of relationship in the Australian tribes to have been at one time common to all. In the Lake Eyre tribes there is female descent with group-marriage. In other tribes in which group-marriage is merely a survival, or is merely indicated by the terminology of relationship, there has been more or less an approach to a form of individual marriage accompanied by a change from female to male descent. Changes such as these are attended also by alteration of the social organisation of the tribes. In one direction there has been a segmentation of the tribe from a division of two intermarrying exogamous moieties of the tribal community to four such divisions, and finally into eight, with a change also in the line of descent. In the other direction there has been a partial or complete loss of this division of the community into four and eight segments. The tribe has become organised on a geographical basis into a number of local groups, and these localities have become exogamous and intermarrying. In these changes in the organisation of the tribes the line of descent has passed from the female to the male line. In the Lake Eyre tribes a group of totems is attached to each exogamous moiety. These remain in existence in the segmentation into four and eight groups. In those tribes where the organisation of the tribe has become local, the totem groups have either become more or less extinct or have changed in extreme cases into magial names without influence in marriage.

Mr. R. S. Lepper offered a discussion of the passing of the matriarchate as observed in southern India, but devoted the time allotted to him to an exhibit of photographs of more or less matriarchal peoples.

On Wednesday M. E. Demolins submitted, under the title "Classification Sociale," an elaborate analysis of types of human society, based upon that of Le Play, but designed to supersede it by a system based upon modern ethnological data. All human societies are either communistic, relying for social progress on the community rather than on the individual, or particularist, with the reverse tendency. The former dominates the east, and explains its immobility; the latter the west, and causes its progress. The communistic societies pass through the three stages of stability, instability, and chaos. In the third, communism is seen breaking down, as in ancient Greece and Italy, or in eastern Europe now. The particularist societies are in turn rudimentary, chaotic (*ébranlée*), and advanced; to the last, as illustrated in Greater Britain and the United States, belong the social types of the future. Within these main types social growth is conditioned by geographical considerations, which determine the dominant forms of human industry and the institutions which result. The paper, which was well illustrated by printed diagrams, gave rise to a lively discussion.

Dr. W. H. R. Rivers described the funeral ceremonies of the Todas. Among points not previously noted are:—(1) the laying of a cloth on the body by those who have married into the clan; (2) a purification-rite, in which a man in woman's ornaments touches the remains with a bow and arrow; (3) the Toda beliefs as to the incidents of the journey to the other world.

Mr. E. S. Hartland exhibited a votive offering from Korea, representing a tiger in roughly cast iron. The Korean mountains are infested by tigers, which were formerly worshipped, and every pass has its votive shrine; probably, therefore, this votive tiger belongs to some tiger-cult.

Mr. E. P. Martin's paper on the Fulahs of Nigeria, and Prof. Ridgeway's anthropological view of the origin of tragedy, were taken as read.

Ægean Archaeology.

The morning session of August 23 was devoted to the results of recent exploration in Crete, and the section adjourned to the New Theatre to secure accommodation for the more numerous audience.

The proceedings opened with a brief address from Dr. P. Kabbadias, Inspector-General of Antiquities in Athens, who discussed the reasons for the great rarity of Neolithic remains in Greek lands, and described the recent operations of the Greek Archæological Society in Thessaly. Dr. Kabbadias's appearance was received with the utmost cordiality, and expression was given by Sir John Evans, Sir Richard Jebb, and by two successive directors of the British School of Archæology in Athens to the general appreciation of his services to the cause of Greek antiquities and to the foreign students of all nationalities in Athens.

The report of the Cretan Exploration Committee summarised the course of the British excavations of 1904, and left the way clear for discussion of the results.

Dr. Arthur Evans, F.R.S., explained his preliminary scheme for the classification and approximate chronology of the periods of Minoan culture in Crete, from the close of the Neolithic to the early Iron age. To the period as a whole it is proposed definitely to attach the name *Minoan*, as indicating the probable duration of successive dynasties of priest-kings, the tradition of which has taken abiding form in the name of Minos. It is proposed to divide this Minoan era into three main periods, early, middle, and late, each with a first, second, and third subperiod. The use of the word *Mycenaean* should be confined to objects of the late and subsidiary outgrowth (*Late Minoan III.*), when the fine motives of the "last Palace Period" at Knossos (now *Late Minoan II.*) are already in the state of decadence observable at Tell-el-Amarna (about 1400 B.C.), and even in earlier objects associated with cartouches of Amenhotep III. and his Queen, in Egypt, Rhodes, Mycenæ, and elsewhere. The less decadent forerunners of this style, in the new-found cemetery at Knossos, are still later than the art of the "last Palace Period." The third late Minoan period may thus be roughly dated between 1500 B.C. and 1100 B.C.

Late Minoan II., which precedes it, is best illustrated, in the latest palace at Knossos, by the fine "Palace style," with its strong architectonic elements, and marked correspondence, in its latest stage, with the art of the Kefts and "Peoples of the Isles of the Sea" on Egyptian monuments of the sixteenth century B.C.; and the royal tomb at Knossos contains alabaster vessels of early eighteenth dynasty date. But the "Palace style" must itself represent a considerable period of development, and its earlier phases must go back at least a century earlier. *Late Minoan II.* may thus extend from about 1700 B.C. to 1500 B.C., corresponding with the Mycenæan shaft graves, and at Knossos with the later Class B of the Palace archives in linear script.

Late Minoan I., an earlier stage of the later Palace, marked off by an extensive catastrophe, is clearly shown in the "Temple Repositories" as an age of ceramic transition with naturalistic art at its highest perfection, and Class A of the linear script. The elaborate lid with King Khyan's name, and a monument of thirteenth dynasty period, date this stratum between 1900 B.C. and 1700 B.C.

The *Middle Minoan* age is especially characterised by the polychrome style of vase-painting on a dark ground, and by the conventionalised pictographic script which precedes the linear. In *Middle Minoan III.* the polychrome is degenerate, and naturalism, in reliefs and on gems, is growing; and it is in *Middle Minoan II.* that the polychrome (formerly "Kamares") style reaches its acme. The beginning of this stage is approximately dated by Egyptian motives on the seal-stones, and by the sherds found by Prof. Petrie in the rubbish-heaps of Kahun, dating from the time of Usertesen II. of the twelfth dynasty (2300 B.C. acc. to Lepsius; Petrie and others say nearly 2700 B.C.). In any case the Cretan evidence excludes the recent theory which makes the twelfth dynasty border on the eighteenth. *Middle Minoan I.* is also represented among the Kahun sherds (which thus give a precise upper limit for *Middle Minoan II.*), and mounts back at least to the middle, and perhaps (on Petrie's chronology) to the beginning of the third millennium.

Beyond this lies the long *Early Minoan* cycle of nascent culture, with geometrical decoration and ornament, generally dark on a light ground, though the dark glaze slip itself goes back to the confines of the Neolithic. Raised decoration on the surface of the clay is also abundant, and the hand-polished, dark-faced Neolithic ware survives throughout. The painted decoration also betrays the influence of the earlier incised designs. A section opened below the pavement of the west court shows a distinct stratification of floor levels of this period, of which the earliest (sub-Neolithic) shows incipient light-ground technique, improved Neolithic fabrics, and the first spiral ornaments, carved or incised, the prototypes, probably Cycladic in origin, of the later painted spirals. Early Minoan seal-stones show adaptation of seventh dynasty motives, and vases of syenite, &c., betray intercourse with dynasties I. to IV., while imported black ware from the first dynasty layer at Abydos is indistinguishable from that of sub-Neolithic Knossos. Comparison of Neolithic with Minoan rates of accumulation of débris gives a probable antiquity for Knossos of 12,000 years in all.

Discussion was opened by Prof. Ridgeway, who agreed with the proposed chronology as far back as the beginning of the eighteenth dynasty, but was not satisfied in regard to the twelfth and beyond. The name "Mycenæan" was no longer appropriate in a generic sense, but the term "Minoan" was open to a similar objection when applied to a period so long and early. His chronological objections were supported in detail by Mr. J. Garstang. Lord Avebury, on the other hand, expressed himself prepared for even longer periods in prehistoric chronology, and Prof. Sayce agreed that the interval between dynasties XII. and XVIII., though archæologically a blank in Egypt, may have been a long one. Dr. Kabbadias and Mr. Hogarth discussed the relations in which Minoan culture stands to Hellenic, the former laying stress on the sociological differences, the latter on the continuity in artistic essentials.

Dr. Evans, in reply, agreed as to the large element of survival from Minoan to Hellenic time, but laid stress on the evidence for the introduction of a fresh ethnic element in the interval. Mr. Garstang's criticisms did not affect the proof that the respective stages of Minoan and Egyptian culture synchronised at the points indicated in his classification.

Other papers on Cretan archæology followed.

Mr. R. M. Dawkins described the painted vases of the Bronze age from Palaikastro, in eastern Crete, with special reference to the styles of decoration, to which Dr. Evans's Knossian classification is applicable at all important points.

Mr. R. C. Bosanquet reported progress in the British School's excavations at Heleia (Palaikastro) and Praisos; a late Mycenæan palace has been excavated, and the main street further explored, with the adjacent houses; more middle Minoan ossuaries have been opened, and also a very early burial-place near Kastri, and a later cemetery with larnax-burials. A steatite libation-table yielded an inscription of seventeen Minoan characters. Within the Minoan town a shattered Hellenic sanctuary contained a slab inscribed in letters of Roman date with an archaic Doric hymn in honour of Young Zeus. This identifies the site with the temple of Zeus Diktaios, and consequently the plain of Palaikastro with the classical place Heleia. At Praisos the west face of the Altar Hill has yielded fragments of architecture and inscriptions from a sanctuary on the summit, among them a fresh document of the Eteocretan language in Hellenic characters of the third or fourth century B.C.

Sir Richard Jebb gave a rendering of the hymn to Zeus, and discussed its allusions to the Curetes and their cult, adding a suggestion (based on Plato, *Laws* 624 A) as to the "nine-year" legend of Minoan legislation; and Prof. R. S. Conway discussed the linguistic character of the Eteocretan language in the light of the new inscription from Praisos, which confirms previous results, and indicates an Indo-European type.

Mr. R. C. Bosanquet described a find of copper ingots at Chalcis, in Eubœa, nineteen in number, and of a characteristic Bronze age form already known from Crete, Cyprus, and Sardinia. The source of supply was probably in Othrys, while Chalcis was the chief emporium. The bronze axe-heads frequently found hoarded in the Ægean (*e.g.* recently in Othrys itself) have shaft-holes too small for use, and may be currency. The memory survived in the Cretan expression "axe" for a fraction of a talent.

Prof. Oscar Montelius gave a well illustrated description of the geometric period in Greece, which succeeds the Mycenæan (late Minoan) in Hellas and the Ægean, though apparently not in Asia Minor. He rejects the view that the geometric style is derived from countries north of Greece, holding that its characteristic motives appear earlier in Greece than in the north. He regards it as a modified continuation of the Mycenæan style, not due merely to the migration of the Dorians (as it is well marked in Attica, which they did not conquer), but mainly to the expulsion of the Tyrrhenian or Pelasgian foreigners, to whom he attributes the Mycenæan culture. He dates the geometric period between the twelfth and the close of the eighth century, and divides it into the three stages marked by the Dipylon, Phaleron, and pre-Corinthian types of vases.

Other Archaeological Papers.

Prof. Valdemar Schmidt, of Copenhagen, summarised the latest discoveries in prehistoric science in Denmark. The musical properties of the famous Bronze age trumpets in the Copenhagen Museum have been re-discovered, and are utilised annually. An earlier period has been established in the Danish Stone age than those of the "kitchen-middens" and the dolmens; for a peat bog in W. Zeeland, near Mullerey Harbour, yields implements of early types which were dropped by the inhabitants of floating "raft-dwellings." Examination of the impressions of corn grains in prehistoric pottery has established the kinds of wheat and barley which were cultivated at different periods. Systematic archæological survey has established the true distribution of tumuli and other monuments. The tumuli follow lines which avoid swamps, converge on fords, and otherwise betray themselves as roads, and offer valuable clues for the location of settlements along them.

Miss Nina Layard's further excavations on a Palæolithic site in Ipswich determined a Palæolithic floor sloping to the margin of a former lake, all now buried 8 feet to 12 feet in brickearth. Forty implements and numerous chipped fragments have been found, and the position of certain well wrought oval implements, in and under compact clay at the lowest levels, identifies them as missiles hurled at water-fowl on the lake. Teeth of elephant, rhinoceros, ox, and deer occur in coarse gravel below the implement layer, and plant-roots in the clay below that.

Prof. E. B. Poulton exhibited records of Palæolithic man from a new locality on the north-east coast of the Isle of Wight, including every stage from flake to finished implement.

The sixth report of the committee on the lake village at Glastonbury announced fresh excavation in 1904, under the joint superintendence of Mr. A. Bulleid and Mr. H. St. G. Gray. Eight mounds, containing two or more floors, were examined, and plans and photographs secured. Objects of amber, glass, and tin, and an adze of iron were found, as well as bronze, stone, and bone objects, and pottery. In one mound, peas were found in some quantity. Arrangements are in progress for the publication of the results of the whole excavation.

Mr. F. R. Coles and Dr. T. H. Bryce described an interment of the early Iron age found at Moredun, near Edinburgh, in 1903. A cist covered with flagstones contained fragmentary human remains of normal local type, with a fibula of La Tène type, a ring-brooch, and a circular open pinhead, indicating a date not later than the second century A.D. This is the first completely attested interment of early Iron age in Scotland.

Dr. T. H. Bryce discussed a phase of transition between the chambered cairns and closed cists in the south-west corner of Scotland. The clue is given by a cairn at Glecknabae, in Bute, which contained two "atypical" chambers set radially in the cairn and containing burnt bones, and a closed cist with unburnt interment. One of the chambers also contained an unburnt fragment. The pottery, which included both typical "chamber" pottery and also fragments of the "beaker" class, indicated a triple occupation of the site, and a late date for the reduced atypical chamber.

The report of the Roman sites committee described work in progress at Silchester and Caerwent, and Mr. T. Ashby summarised the season's progress on the latter site. The south gate has been found to be parallel to the gate on the other side, and an inscription dedicated to Mars bears the date August 23, 152 A.D.

Prof. Flinders Petrie's excavations at Ehnasya have been already mentioned in connection with his series of Roman lamps. Ehnasya is the Roman Herakleopolis Magna and the Egyptian Henensuten, about 70 miles south of Cairo and 10 miles from the Nile. It was the home of the ninth and tenth dynasties, of which hardly anything is known. It is found to contain temples of the eighteenth and twelfth dynasties, and under the latter a stratum of older houses and burials with scarabs of Antef V. This king has recently been assigned to dynasty XVI. or XVII., but is thus brought earlier than dynasty XII. Later buildings of dynasty XXIII. yielded a fine votive statuette, in gold, of the local ram-headed deity, Hershefia, dedicated by a vassal of King Piankhi; and houses of Roman date gave important evidence as to the stages by which Christianity first displaced the native animal-cults, and then itself absorbed the Isis and Horus worship as the Madonna-cult.

Mr. J. Garstang described his excavations in the Royal tomb of Negadeh, in Upper Egypt, which completed the work begun some years back by the French, and recovered another fragment of the "Tablet of Mena," to whom the tomb has been commonly attributed.

Mr. R. N. Hall's recent excavations at Great Zimbabwe show the ruins to be three times larger than was supposed, and distinguish clearly between (*a*) the original constructions (*e.g.* the eastern half of the "Elliptical Temple"), which are still of uncertain age and associated with numerous phalli, and (*b*) sundry additions which are shown by Arab pottery to be not older than about 1300 A.D., and do not contain phallic objects. Much useful work has been done on behalf of the Chartered Company to preserve existing structures, and to clear the ruins of surface deposits and other obstacles to study.

BOTANY AT THE BRITISH ASSOCIATION.

THE meeting of the botanical section at Cambridge may probably be regarded as the most successful of the whole series of meetings which have been held since botany was constituted a separate section of the British Association. A large number of distinguished foreign botanists were present, and there was a fully representative gathering of British botanists to meet them. By the kindness of Prof. H. Marshall Ward, F.R.S., the meetings were held in the rooms of the new botany school, which proved to be admirably suited for the purpose. Prof. Ward and the botanical staff are to be congratulated upon the excellent arrangements made for the lectures, lantern demonstrations, exhibition of apparatus and specimens, &c., which contributed so much to make the meeting a success.

The president (Mr. Francis Darwin, F.R.S.) in his address, which has already appeared in NATURE (September 8), dealt with the perception of the force of gravity by plants, and especially with the statolith theory of geotropism.

The general work of the section included, in addition to the more technical papers, the usual semi-popular lecture, and a series of three addresses of a general character on important topics.

The subject of the semi-popular lecture, which was delivered by Dr. D. H. Scott, F.R.S., was a new aspect of the Carboniferous flora. It was shown that Brongniart's conception of the Carboniferous period as the reign of Cryptogams can no longer be maintained. Recent work has all tended to show that a large number—perhaps the majority—of the so-called ferns of that period were not true ferns at all, but seed-bearing plants approaching the Cycadophyta. While their affinity with ferns is evident, these plants had already acquired spermatophytic methods of reproduction—hence the name Pteridospermeæ is proposed for them. If we further take into account the seed-plants previously known—notably the Cordaiteæ—and those Lycopods which produced organs analogous to seeds, we are led to the conclusion that quite half the vascular plants of the Carboniferous period had already assumed the seed-habit.

Ecology.

Prof. A. G. Tansley, in an address on the problems of ecology, defined ecology for his purpose as the study of those relations of plants to their environment dependent on geographical and topographical factors. It is very largely topographical aggregates, due to soil, water, and other conditions with which ecology has to do, and the study of these falls into two parts, descriptive and experimental. The problems to be solved may be indicated during the progress of an ordinary botanical survey, but it requires the establishment of experimental stations in regions characterised by definite and specialised floras in order that the detailed investigation of the functional relations of plants to their surroundings may be more completely carried out.

Dr. W. G. Smith, whose work in connection with the botanical surveys of the north of England is so well known, in referring to the ecological aspect of the British flora, pointed out that a general survey of the chief plant associations of Britain has so far revealed some broad principles of distribution in relation to soil and climate, and that when wider areas are investigated the chief plant associations may be more clearly defined as climatic, edaphic, or biological formations.

Mr. T. W. Woodhead gave an interesting account of his observations on the biology and distribution of woodland plants, and dealt with some of the principal factors, such as shade, soil, &c., which tend to modify the plant associations under trees.

Prof. A. Engler (Berlin) read a paper on the plants of the northern temperate zone in their transition to the high mountains of tropical Africa, in which he pointed out that the differences seen in most of the highland forms of plants of tropical Africa, as compared with their relatives of the northern temperate zone, are always in harmony with the different climatic conditions. The modifications observed may be regarded as adaptations, but only in the sense that the adaptation is a passive one caused by the physical con-